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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,382	09/10/2003	Jason A. Graetz	26-06	6022

23713 7590 12/06/2006

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EXAMINER	
LEE, CYNTHIA K	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/660,382	GRAETZ ET AL.	
	Examiner	Art Unit	
	Cynthia Lee	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *13-25 and 32-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 26-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/15/2003, 5/4/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Election/Restrictions

Applicant's election with traverse of Group I, Species I-a in the reply filed on 9/28/2006 is acknowledged. Claims 26 and 29 have been amended to depend from claims 1 and 8. Claims 26-31 have been incorporated into Group I. Full consideration was given to claims 1-12 and 26-31.

The traversal is on the ground(s) that the species are closely related and as such, no undue burden is placed on the Office in examining all of claims 1-20 and 26-35. The species are distinct because they all have different (mechanical/functional means or characteristics) or (materials/composition) as set forth above (see MPEP 809.02(a)). Accordingly, each species requires a different field of search (see MPEP 808.02). Thus, there is a patentable difference between the species as claimed and there would be a serious burden on the examiner if restriction is not required. Restriction for examination purposes as indicated above is proper.

The requirement is still deemed proper and is therefore made FINAL.

Priority

Acknowledgement has been made of applicant's claim for priority under 35 USC 119 (e).

Preliminary Amendment

The claims filed 9/28/2006 has been placed in the application file and the information referred to therein has been considered as to the merits.

Information Disclosure Statement

The Information Disclosure Statement (IDS) filed 5/4/2006, 1/15/2004 has been placed in the application file and the information referred to therein has been considered.

Drawings

The drawings received 2/5/2004 are acceptable for examination purposes.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "about" is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially" is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Sayama (New active material structure in Si thin film electrode for rechargeable lithium batteries, Abstract 52, The 11th meeting on Lithium Batteries, Monterey CA, June 23-28, 2002).

Sayama discloses an electrode for rechargeable lithium batteries comprising a silicon nanofilm. Silicon thin films were deposited by a plasma CVD or an RF magnetron sputtering method on the current collector of electrolytic copper foil. The film thickness was between 2 and 10 um and is amorphous. See Experimental and Results and Discussion.

The Examiner notes that in claim 1, silicon nanofilm and lithium alloy thereof are written in the alternative language and thus, claim 3 does not positively recite a lithium alloy.

Claims 1 and 3-6 are anticipated by Sayama.

Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (The crystal structural evolution of nano-Si anode caused by lithium insertion and extraction at room temperature, Solid State Ionics, 135 (2000) 181-191).

Li discloses an electrode comprising a silicon nanoparticle. The diameter of the nanoparticle is 80 um (see Experimental). Li discloses that the insertion of lithium ions at room temperature destroys the crystal structure of Si gradually and leads to the formation of metastable amorphous Li-Si alloy. Furthermore, local ordered sutrcture of Si can be restored after the partial extreaction of lithium ions, which indicates the extraction of lithium ions promoting the rectystallization of amorphous Li-inserted Si (see Absract).

The Examiner notes that in claim 8, silicon nanoparticle and lithium alloy thereof are written in the alternative language and thus, claim 10 does not positively recite a lithium alloy.

Claims 8-11 are anticipated by Sayama.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 and 7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sayama (New active material structure in Si thin film electrode for rechargeable lithium batteries, Abstract 52, The 11th meeting on Lithium Batteries, Monterey CA, June 23-28, 2002) as applied to claim 1.

Saya does not expressly disclose that the silicon nanofilm alloys with lithium at ambient temperature (instant claim 2). However, the Examiner notes that it is an inherent property when lithium ions are inserted into Si particles (See Li, abstract).

Sayama does not disclose that the silicon nanofilm is synthesized by physical vapor deposition (instant claim 7). Sayama discloses that the silicon nanofilm is synthesized by plasma CVD or an RF magnetron sputtering method (see Experimental). However, the courts have held that the method of forming the product is not germane to the issue of patentability of the product itself. "[Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from the product of prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Claim 12 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Li (The crystal structural evolution

of nano-Si anode caused by lithium insertion and extraction at room temperature, Solid State Ionics, 135 (2000) 181-191).

Li does not disclose that the silicon nanoparticle is synthesized by inert gas condensation and ballistic consolidation. Li discloses that the nanoparticles are coated from a slurry onto a current collector (see Experimental). However, the courts have held that the method of forming the product is not germane to the issue of patentability of the product itself. "[Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from the product of prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sayama (New active material structure in Si thin film electrode for rechargeable lithium

batteries, Abstract 52, The 11th meeting on Lithium Batteries, Monterey CA, June 23-28, 2002) as applied to claim 1 above.

Sayama discloses all the elements of claim 1. Sayama does not disclose a battery comprising an anode, a cathode, and an electrolyte. However, Sayama discloses that the Si thin film electrode is for rechargeable lithium batteries. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Sayama's Si thin film electrode for rechargeable lithium batteries for the benefit of providing power to electronic devices. The Examiner notes that a battery necessarily has a cathode, an anode, and an electrolyte.

Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (The crystal structural evolution of nano-Si anode caused by lithium insertion and extraction at room temperature, Solid State Ionics, 135 (2000) 181-191) as applied to claim 8.

Li discloses all the elements of claim 8. Li does not disclose a battery comprising an anode, a cathode, and an electrolyte. Li discloses of making a cell using an electrode, a counter electrode and an electrolyte (see experimental). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Li's nano-Si anode in a rechargeable battery, in particular a rechargeable lithium ion battery, for the benefit of providing power to electronic devices.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ckl

Cynthia Lee

Patent Examiner

SUSY TSANG-FOSTER
PRIMARY EXAMINER